MODEL 9500

TEST PROCEDURE
AND
CALIBRATION

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3-20-85

9500 CHANEL BANK TEST SET
SCHEMATICS & ASSEMBLIES

DP9500-018-01	MODEL 9500 ASSEMBLY (3PGS)
DS9500-018-02	INTERCONNECT DIAGRAM (9500)
DS9500-018-03	INTERCONNECT DIAGRAM (9500B)
DP9500-018-03	MODEL 9500B ASSEMBLY (3PGS)
DP9500-029-01	SWITCHING BOARD ASSEMBLY
DS9500-031-01	ACTIVE BOARD SCHEMATIC
DP9500-031-01	ACTIVE BOARD ASSEMBLY
DS9500-033-02	CONNECTOR BOARD SCHEMATIC
DS9500-035-01	PROBE BOARD SCHEMATIC
DP9500-038-02	D1 PROBE (9501B) SCHEMATIC
DP9500-044-02	WIRING HARNESS (9500B) SCHEMATIC
DP9500-045-02	CABLE SUB D1 PROBE (9501B) ASSEMBLY
CP9500-060-01	D3 EXTENDER BOARD ASSEMBLY
DP9500-073-01	CABLE ASSY, 9500 CHANEL TEST ASSEMBLY

INTRODUCTION

The following is the 9500 Test Procedure that will enable you to test the different functions of the 9500 Channel Test Set.

The green connector you have received is to make a test fixture for trouble-shooting. To apply -48V to the probes, while signaling each other, all you will need is one power supply with -48 (pin 1) and +48 (pin 2). From the other side of the supply, attach -48 (pin 4) and +48 (pin 6). DO NOT ground either side of the "-" or "+" voltage to the power supply. Wire them to the back of the connector, and put the DI probe into the connector. Refer to Fig. 2, Page 5 for test fixture connections.

9500 TEST PROCEDURE

1.) PROBE TEST, PRELIMINARY:

a.) Equipment required:

Power Supply	Power Designs	TW5005
Power Supply	Power Designs	6050
Oscilloscope	Tektronics	422
Pulse Generator	Chronetics	PG-11
Multi-meter	Triplett	630 NA-3
Test Fixture	(External Voltage Test Jig for D-1 Probe)	

2.) OSCILLATOR ADJUSTMENT PROCEDURE FOR MULTI-FREQ:

1.) Refer to schematic drawing S9500-031-01 for tests in Section two (2) and three (3).

2.) To access the Active Board, the main chassis must be pulled patially out, but remain electrically connected. (Continued next page.)

2.) OSCILLATOR ADJUSTMENT PROCEDURE: (Continued)

a.) Plug probe into the socket on the side of the 9500.

b.) Set power supply to -48V, and plug into "-48 IN" on 9500.

c.) Set front panel as follows:

- Function - TRMT
- Selector - DPO
- Mode - LINE
- TRMT - 1 KHZ

d.) Plug dbm meter into "T-R Drop" jack.

e.) Set R41 for a reading of 1020 Hz on frequency counter

f.) Set R35 for 0 dbm, 600 ohm termination on db meter, and at the same time, make sure that frequency stays the same.

g.) Change TRMT switch to "MF".

h.) Connect TP8 to ground.

i.) Momentarily ground junction R28, C8.

j.) Adjust R43 and 426 to 700 Hz and -6.0 dbm $\pm$0.1 dbm.

k.) Momentarily remove ground from TP8 to stop oscillator.

l.) Repeat steps (i) - (k) for the following frequencies:

Freq.	RxCx	Freq. Pot	Level Pot.	Level
1020	R C	R41	R35	0 dbm
700	R28 C8	R43	R46	-6 dbm
900	R29 C9	R52	R55	-6 dbm
1100	R30 C10	R61	R64	-6 dbm
1300	R31 C11	R70	R73	-6 dbm
1500	R32 C12	R79	R82	-6 dbm
1700	R33 C13	R88	R91	-6 dbm

NOTE: FOR BETTER STABILITY OF THE MULTI-FREQUENCY OSCILLATORS, THERE HAS BEEN A MODIFICATION OF THE TRANSISTORS TO 2N2369. THIS WILL BE Q-10 THROUGH Q-23 ON THE ACTIVE BOARD.

3.) DIAL PULSE TEST:

a.) Set counter to "Period", "sens" one quarter CCW.

b.) Connect Oscilloscope to CR-1 , annode and ground, on active board.

c.) Adjust R17 for a period of 100 m sec. ±1.0 m sec.

d.) Set counter to "Time Interval", and coupling to neg. pulse.

e.) Watching oscilloscope and counter, set off time to 41 m sec., ± 1.0 m. seconds. Adjust R-21 for 41 m sec. off time.

f.) Remove ground from TP8.

g.) Set counter to "Manual Mode", "Frequency", Storage Off".

h.) Depress the "1" button on the front panel of the 9500. Counter should read one. Depress the "2" button. Counter should read three. Continue with the rest of the numbers including KP (*) and ST (#). Total should read 57.

i.) Disconnect oscillope probe.

4.) TRANSMIT LEVEL TEST:

a.) Set the front panel controls as follows:

- FUNCTION - TRMT
- SELECTOR - - - - - - - - - - - - - - - - - - - DPO
- MODE - LINE
- TRMT - 1 KHZ

b.) Plug a dbm meter into the T-R DROP jack on the side panel.

c.) Set the dbm meter to 900 ohms terminating.

d.) The reading should be 0.0 dbm.

e.) Switch the SELECTOR button to 4W - E&M.

f.) Change the dbm meter to 600 terminating.

g.) Meter should read -16.0 dbm, ± 0.2 dbm.

h.) Change the MODE switch to DROP.

i.) Plug the dbm meter into the TIRI LINE jack on the side panel.

j.) The meter should read +7.0 ± 0.2 dbm.

k.) Disconnect the dbm meter from the 9500.

5.) METER CALIBRATION:

a.) Set the 9500 front panel controls as follows:

- FUNCTION - MEAS.
- SELECTOR - DPO
- MODE - DROP

b.) Connect the signal generator to the attenuator, and plug the attenuator into TR LINE jack on the side panel of the 9500.

c.) Monitor the output of the attenuator with a dbm meter set to 900 ohms bridging.

d.) Set the output of the sig. gen. - attenuator to 0.0 dbm, 1000 khz.

e.) Adjust ~~R420~~ for a reading of 0.0 ± 0.0 dbm, on the 9500 meter. (Active Board)

f.) Change the SELECTOR to 4W E&M.

g.) Change the dbm meter to 600 ohms and adjust the attenuator output as necessary to maintain 0.0 dbm.

h.) Change the MODE to LINE.

i.) Plug the attenuator into TIRI Drop jack on the side of the 9500.

j.) Check that the 9500 meter reads 0.0 ± 0.2 dbm.

k.) Plug the attenuator into METER INPUT on the 9500.

l.) Check that the 9500 meter reads 0.0 ± 0.2 dbm.

m.) Disconnect the attenuator from the 9500.

6.) AUDIO TALK TEST:

a.) Set the 9500 front panel controls as follows:

- FUNCTION -SIG/DET
- SELECTOR -DPO
- MODE -LINE

b.) Plug the oscilloscope into the TR drop jack on the side panel.

c.) Depress the TALK button on the 9500. Talk into the speaker.

d.) Watch for the speech pattern on the oscilloscope.

e.) Disconnect the oscilloscope.

7.) SIGNALING TEST:

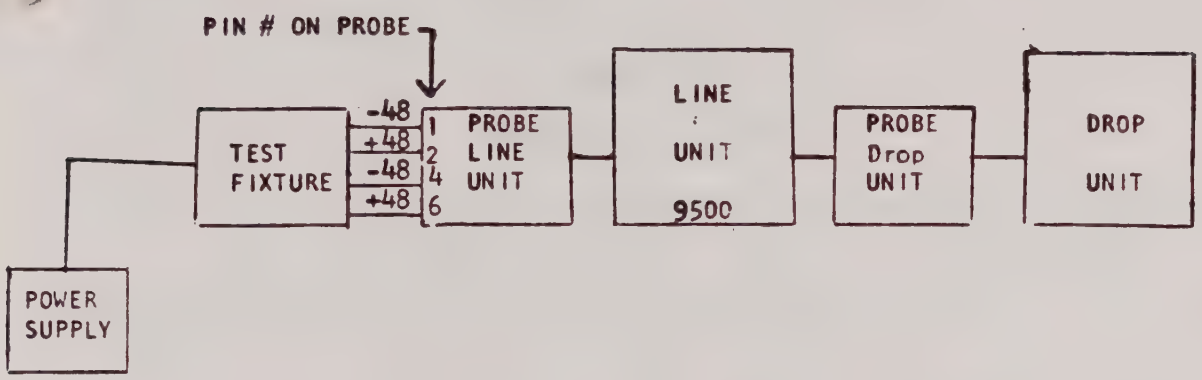
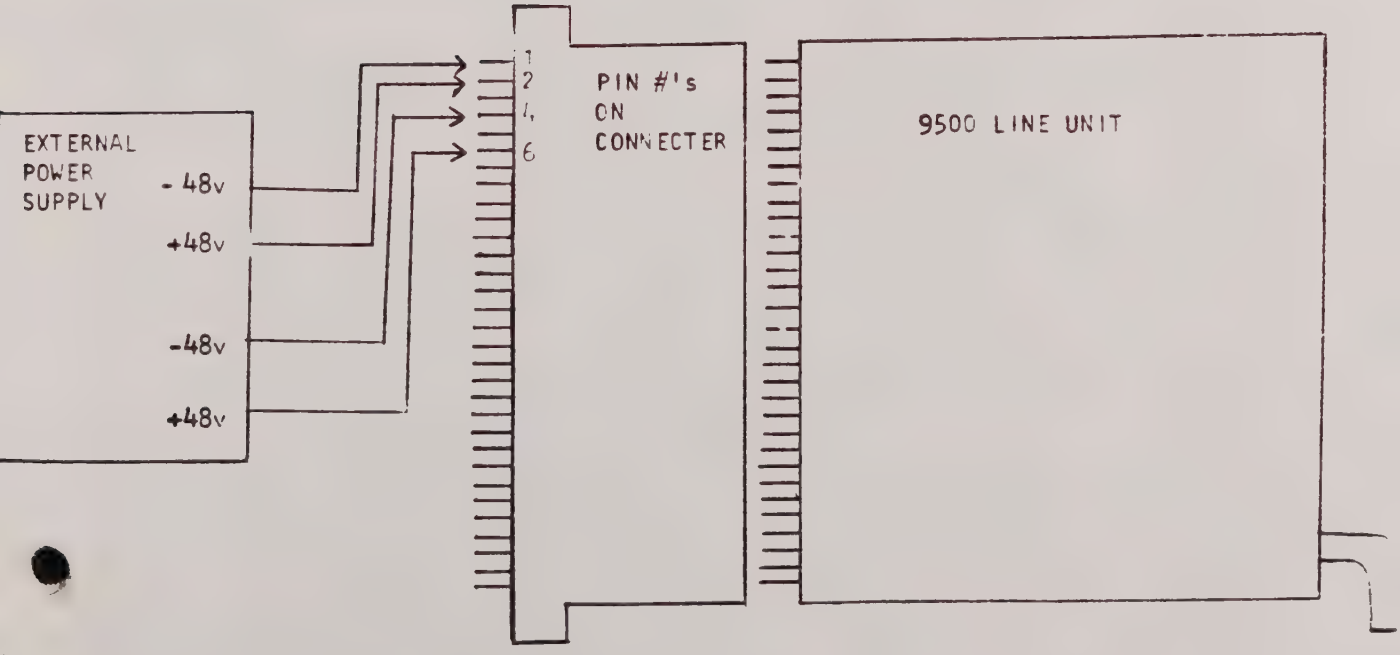


FIG. 1

a.) Follow step shown in signaling test outline.

b.) Inter-change the position of drop unit and line unit. Repeat Signaling Test.

FIG. 2



This is the signaling test to get the 9500's to talk to each other. Plug the D-1 probe from the drop side into the channel of the line side. Appply voltage to the pins on the D-1 probe of the line side. Signal between each unit, then reverse the procedure.

Model 9500A

Signaling Test Outline

UNIT A	LINE SIDE TEST	UNIT B	DROP SIDE TEST
SIG/DET DPO LINE ON HOOK	DIAL PULSE - ON ____ ON HOOK - ON ____	SIG/DET DPO DROP ON HOOK	DIAL PULSE - ON ____ ON HOOK - ON ____
OFF HOOK	BAT REV. - LITES ____		ON HOOK OFF ____
DIAL "0"	DIAL PULSE - BLINKS ____ BAT REV. - BLINKS ____		ON HOOK - FLASHES ____ SPEAKER - PULSE ____
	BAT REV. OFF ____	OFF HOOK	____
TRMT MF	MF LAMP LITES ____ DIAL PULSE - OFF ____		ON HOOK - MUST STAY OFF ____
SEND ALL NUMBERS	____		SPEAKER - OUTPUT ____
1 kHz	MF LAMP OFF ____		SPEAKER - OUTPUT ____
	____	MEAS.	METER - ____ DIAL PULSE OFF ____ ON HOOK LITES ____
MF	MF LAMP - LITES ____		METER - NO READING ____
	____	TRMT MF	MF LAMP - LITES ____
	SPEAKER - OUTPUT ____	SEND ALL NUMBERS	____
	SPEAKER - OUTPUT ____	1 kHz	MF LAMP OFF ____
MEAS	METER - 0 ____ MF LAMP OFF ____		____
SIG/DET	METER - NO READING ____ DIAL PULSE - LITES ____		____
	____	SIG/DET	ON HOOK OFF ____ DIAL PULSE - LITES

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UNIT A	LINE SIDE TEST	UNIT B	DROP SIDE TEST
	BAT. REV. - LITES ____	ON HOOK	____
ON HOOK	BAT. REV. OFF____		ON HOOK - LITES ____
DPT	--- ____	DPT	--- ____
	ON HOOK OFF ____	OFF HOOK	BAT. REV. - LITES____
	ON HOOK - FLASHES____ SPEAKER - PULSE ____	DIAL "0"	DIAL PULSE - BLINKS____ BAT. REV. - BLINKS ____
OFF HOOK	____		BAT. REV. OFF ____
ON HOOK	____		BAT. REV. - LITES ____
	ON HOOK - LITES ____	ON HOOK	BAT. REV. - OFF____
SDP	GRD LAMP - LITES ____		____
	____	SDP	GRD LAMP - LITES ____
OFF HOOK	GRD LAMP OFF ____ BAT. REV. - LITES ____		ON HOOK OFF ____
DIAL "0"	DIAL PULSE & BAT REV. BLINKS ____ ____ GRD LAMP - FLASES ____		ON HOOK - FLASHES ____ SPEAKER - PULSE ____
	BAT. REV. OFF____	OFF HOOK	____
	BAT. REV. - LITES ____	ON HOOK	____
ON HOOK	GRD LAMP - LITES ____ BAT. REV. OFF ____		ON HOOK - LITES ____
.2W E & M	GRD LAMP OFF____		____
	____	2W E & M	GRD LAMP - OFF ____
OFF HOOK	____		ON HOOK OFF ____
	ON HOOK OFF____	OFF HOOK	____
4W E & M	--- ____	4W E & M	--- ____
1 kHz	--- ____		____

ADDITIONAL RESTS: 4 WIRE E&M DIAL PULSE OK (✓)____
4 WIRE E&M "WINK-BACK" OK (✓)____

A-B0001-023-01

UNIT A	LINE SIDE TEST	UNIT B	DROP SIDE TEST
TRMT	DIAL PULSE OFF ___		SPEAKER - OUTPUT ___
	___	MEAS	METER - -16 ___ DIAL PULSE OFF ___
MEAS	___		METER - NO READING ___
	METER - +7 ___	TRMT	___
SIG/DET	METER - NO READING ___ DIAL-PULSE LITES ___		___
	___	SIG/DET	DIAL PULSE - LITES ___
	ON HOOK - LITES ___	ON HOOK	___
ON HOOK	___		ON HOOK - LITES ___
FX (SUB)	ON HOOK ~~-~~ OFF ___		___
	___	FX (SUB)	ON HOOK OFF ___
DISCONNECT -48V FLT AND GRD FLT LEADS FROM POWER SUPPLY CONNECT PIN 26 TO B- (-48V) AND PIN 25 TO B+ (GRD)			
	DIAL PULSE - ON ___ GRD LAMP - ON ___ ON HOOK - ON ___		DIAL PULSE - ON ___ GRD LAMP - ON ___ ON HOOK - ON ___
	--- ___	GRD START AND HOLD	--- ___
GRD START AND HOLD	___		GRD LAMP OFF ___
	___	RELEASE GRD START	GRD LAMP - LITES ___
	GRD LAMP OFF ___	OFF HOOK	ON HOOK OFF ___
RELEASE GRD START	GRD LAMP - LITES ___		ON HOOK - LITES ___
OFF HOOK	___		ON HOOK OFF ___
DIAL "0"	DIAL PULSE - BLINKS ___		ON HOOK - FLASHES ___ SPEAKER - PULSE OUTPUT ___

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UNIT A	LINE SIDE TEST	UNIT B	DROP SIDE TEST
	BAT. REV. - LITES ____ SPEAKER - CLICK ____	RING	GRD LAMP OFF ____
	BAT. REV. - LITES ____	ON HOOK	____
ON HOOK	BAT. REV. OFF ____		ON HOOK - LITES ____
	--- NOTE: DO NOT REVERSE THESE	FX (OFF) TWO STEPS.	____
FX (OFF)	--- ____		--- ____
GRD START AND HOLD	--- ____		--- ____
	GRD LAMP OFF ____	GRD START AND HOLD	____
RELEASE GRD START	GRD LAMP - LITES ____		____
OFF HOOK	ON HOOK OFF ____		GRD LAMP OFF ____
	ON HOOK - LITES ____	RELEASE GRD START	GRD LAMP - LITES ____
	ON HOOK OFF ____	OFF HOOK	____
	ON HOOK - FLASHES ____ SPEAKER - PULSE ____	DIAL "0"	DIAL PULSE - BLINKS ____
ON HOOK	____		BAT. REV. - LITES ____
	ON HOOK - LITES ____	ON HOOK	BAT. REV. - OFF ____

A-B0001-023-01

ASSEMBLY NAME ASSEMBLY, ACTIVE BOARD

ASSEMBLY NUMBER D-P9500-031-01

PARTS LIST

REF DES	ITEM NO.	STOCK NO.	DESCRIPTION	TOTAL QTY	NOTES	MFR CODE IDENT	MANUFACTURERS PART NUMBER
C1		910100017	CAP., DISC 100 pf, 1KV	2		71590	DD101
C2		910500011	CAP., MYLAR .15 uf, 5%, 100 VDC	3		27556	ZA28154J
C3		910100005	CAP., DISC .1 uf, 10V	8		71590	UK10-104
C4		910500011	CAP., MYLAR .15 uf, 5%, 100 VDC			27556	ZA28154J
C5		910100001	CAP., DISC .0022 uf, 1 KV	2		71590	DD222
C6		910100004	CAP., DISC .05 uf, 25V	2		71590	UK25-503
C7		910100004	CAP., DISC .05 uf, 25V			71590	UK25-503
C8		910100005	CAP., DISC .1 uf, 10V			71590	UK10-104
C9		↕	↕			71590	UK10-104
C10						71590	UK10-104
C11		910100005	CAP., DISC .1 uf, 10V			71590	UK10-104

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SHEET 1 OF 26

ISSUE L CHANGE ORDER 117, 187, 196 [illegible] 556 567 575 601

ASSEMBLY NAME ASSEMBLY, ACTIVE BOARD

ASSEMBLY NUMBER D-P9500-031-01

PARTS LIST

REF DES	ITEM NO.	STOCK NO.	DESCRIPTION	TOTAL QTY	NOTES	MFR CODE IDENT	MANUFACTURERS PART NUMBER
C12		910100005	CAP., DISC .1 uf, 10V			71590	UK10-104
C13		910100005	CAP., DISC .1 uf, 10V			71590	UK10-104
C14		910500011	CAP., MYLAR .15 uf,5%, 100 VDC			27556	ZA28154J
C15		910700004	CAP., MET. POLYCARB. .01 uf, 5%, 50V	14		27556	BY2A103J
C16		910700004	CAP., MET. POLYCARB. .01 uf, 5%, 50V			27556	BY2A103J
C17						27556	BY2A103J
C18						27556	BY2A103J
C19						27556	BY2A103J
C20						27556	BY2A103J
C21						27556	BY2A103J
C22						27556	BY2A103J
C23						27556	BY2A103J
C24						27556	BY2A103J
C25		910700004	CAP., MET. POLYCARB, .01 uf, 5%, 50V			27556	BY2A103J

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SHEET 2 OF 26

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ASSEMBLY NUMBER D-P9500-031-01.

PARTS LIST

REF DES	ITEM NO.	STOCK NO.	DESCRIPTION	TOTAL QTY	NOTES	MFR CODE IDENT	MANUFACTURERS PART NUMBER
C26		910700004	CAP., MET. POLYCARB. .01 uf, 5%, 50 V			27556	BY2A103J
C27		910700004	CAP., MET. POLYCARB. .01 uf, 5%, 50 V			27556	BY2A103J
C28		910700004	CAP., MET. POLYCARB. .01 uf, 5%, 50V			27556	BY2A103J
C29		910100017	CAP., DISC 100 pf, 1KV			71590	D0101
C30			NOT USED				
C31			NOT USED				
C32			NOT USED				
C33			NOT USED				
C34			NOT USED				
C35			NOT USED				
C36		910100001	CAP., DISC .0022 uf, 1 KV			71590	D0222

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SHEET 3 OF 26

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ASSEMBLY NUMBER D-P9500-031-01

PARTS LIST

REF DES	ITEM NO.	STOCK NO.	DESCRIPTION	TOTAL QTY	NOTES	MFR CODE IDENT	MANUFACTURERS PART NUMBER
C37	2	910100009	CAP., DISC .47 uf, 10V	1		71590	UK10474
C38		910100019	CAP., DISC 470 pf, 1 KV	1		71590	D0471
C39		910100021	CAP., DISC 820 pf, 1 KV	1		71590	D0821
C40		910200003	CAP., ELECT. NP 5 uf, 30 V	1		29309	JA-3-5-30-8M
C41		910100005	CAP., DISC .1 uf, 10V			71590	UK10-104
C42			NOT USED				
C43			NOT USED				
C44			NOT USED				
C45		910200012	CAP., ELECT. 50 uf, 50 V	2		56289	5000506G050007
C46		910200012	CAP., ELECT. 50 uf, 50 V			56289	5000506G050007

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SHEET 4 OF 26

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ASSEMBLY NAME ASSEMBLY, ACTIVE BOARD

ASSEMBLY NUMBER D-P9500-031-01

PARTS LIST

REF DES	ITEM NO.	TTI STOCK NO.	MFR CODE IDENT	MANUFACTURERS PART NUMBER	DESCRIPTION	TOTAL QTY	NOTES
C47		910200011	56289	500D506G016CB7	CAP., DISC 50 uf, 16V	2	
C48		910200011	56289	500D506G016CB7	CAP., DISC 50 uf, 16V		
C49		910200053	56289	196D156X9020KAI	CAP., ELECTROLYTIC, 15 uf, 20V	3	
C50		910100022	71590	UK25-103	CAP., DISC, .01 uf, 25V	3	
C51		910200053	56289	196D156X9020KAI	CAP., ELECTROLYTIC, 15 uf, 20V		
C52		910200049	56289	196D476X9020PE4	CAP., ELECTROLYTIC, 47 uf, 20V	2	
C53		910200049	56289	196D476X9020PE4	CAP., ELECTROLYTIC, 47 uf, 20V		
C54		910200056	56289	196D107X9010PE4	CAP., ELECTROLYTIC, 100 uf, 10V	1	
C55		910100022	71590	UK25-103	CAP., DISC, .01 uf, 25V		
C56		910100022	71590	UK25-103	CAP., DISC, .01 uf, 25V		
C57		910200053	56289	196D156X9020KAI	CAP., ELECTROLYTIC, 15 uf, 20V		
CR1		940200032	03508	1N4148	DIODE, SILICON 1N4148	23	
CR2		940200032	03508	1N4148	DIODE, SILICON 1N4148		
CR3		940200032	03508	1N4148	DIODE, SILICON 1N4148		
CR4		940200032	03508	1N4148	DIODE, SILICON 1N4148		
CR5		940200032	03508	1N4148	DIODE, SILICON 1N4148		
CR6		940200032	03508	1N4148	DIODE, SILICON 1N4148		

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ISSUE L CHANGE ORDER

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ASSEMBLY NAME ASSEMBLY, ACTIVE BOARD

ASSEMBLY NUMBER D-P9500-031-01

PARTS LIST

REF DES	ITEM NO.	TTI STOCK NO.	MFR CODE IDENT	MANUFACTURERS PART NUMBER	DESCRIPTION	TOTAL QTY	NOTES
CR7		940200032	03508	1N4148	DIODE, SILICON 1N4148		
CR8		940200032	03508	1N4148	DIODE, SILICON 1N4148		
CR9		940200032	03508	1N4148	DIODE, SILICON 1N4148		
CR10		940200032	03508	1N4148	DIODE, SILICON 1N4148		
CR11		940200032	03508	1N4148	DIODE, SILICON 1N4148		
CR12		940200032	03508	1N4148	DIODE, SILICON 1N4148		
CR13		940200032	03508	1N4148	DIODE, SILICON 1N4148		
CR14		940200032	03508	1N4148	DIODE, SILICON 1N4148		
CR15		940200032	03508	1N4148	DIODE, SILICON 1N4148		
CR16		940200032	03508	1N4148	DIODE, SILICON 1N4148		
CR17		940200032	03508	1N4148	DIODE, SILICON 1N4148		
CR18		940200032	03508	1N4148	DIODE, SILICON 1N4148		
CR19		940200032	03508	1N4148	DIODE, SILICON 1N4148		
CR20		940200004	04713	1N4742A	DIODE, ZENER 12V, 5%, 1W 1N4742A	2	
CR21		940200004	04713	1N4742A	DIODE, ZENER 12V, 5%, 1W 1N4742A		
CR22		970100001	14099	SBR05M	BRIDGE, RECTIFIER	1	
CR23		940200016	04713	1N5232B	DIODE, ZENER 5.6V, 5%, 1/2W 1N5232B	1	

ISSUE L CHANGE ORDER

ASSEMBLY NAME ASSEMBLY, ACTIVE BOARD.
ASSEMBLY NUMBER D-P9500-031-01.

PARTS LIST

REF DES	ITEM NO.	STOCK NO.	DESCRIPTION	TOTAL QTY	NOTES	MFR CODE IDENT	MANUFACTURERS PART NUMBER
CR24		940200032	DIODE, SILICON 1N4148			03508	1N4148
CR25		↕	↕			03508	1N4148
CR26		↕	↕			03508	1N4148
CR27		940200032	DIODE, SILICON 1N4148			03508	1N4148
CR28		940200003	DIODE, ZENER 5.1V, 5%, 1W 1N4733A	1		04713	1N4733A
CR29		940200025	DIODE, 1N4004	1		03E77	1N4004
IC1		950200011	INTEGRATED CIRCUIT, SN7496N	2		01295	SN7496N
IC2		950200011	INTEGRATED CIRCUIT, SN7496N			01295	SN7496N
IC3		950200002	INTEGRATED CIRCUIT, SN7400N	6		01295	SN7400N
IC4		950200002	INTEGRATED CIRCUIT, SN7400N			01295	SN7400N
IC5		950200002	INTEGRATED CIRCUIT, SN7400N			01295	SN7400N

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PALO ALTO, CALIFORNIA 94303

DRAWING NUMBER A-P9500-031-01

SHEET 7 OF 26

PRINTED ON DITTO NO. 1888H CLEARPRINT

ASSEMBLY NAME ASSEMBLY, ACTIVE BOARD

ASSEMBLY NUMBER D-P9500-031-01

PARTS LIST

REF DES	ITEM NO.	STOCK NO.	DESCRIPTION	TOTAL QTY	NOTES	MFR CODE IDENT	MANUFACTURERS PART NUMBER
IC6		950200005	INTEGRATED CIRCUIT, SN7405N	2		01295	SN7405N
IC7		950300002	INTEGRATED CIRCUIT, SP317A	3		18324	SP317A
IC8		950300002	INTEGRATED CIRCUIT, SP317A			18324	SP317A
IC9		950300002	INTEGRATED CIRCUIT, SP317A			18324	SP317A
IC10		950200002	INTEGRATED CIRCUIT, SN7400N			01295	SN7400N
IC11		950200002	INTEGRATED CIRCUIT, SN7400N			01295	SN7400N
IC12		950200002	INTEGRATED CIRCUIT, SN7400N			01295	SN7400N
IC13		952000011	INTEGRATED CIRCUIT, 741TC	10		07263	741TC
IC14		950200005	INTEGRATED CIRCUIT, SN7405N			01295	SN7405N
IC15		952000011	INTEGRATED CIRCUIT, 741TC			07263	741TC
IC16						07263	741TC
IC17						07263	741TC
IC18		952000011	INTEGRATED CIRCUIT, 741TC			07263	741TC

ISSUE L CHANGE ORDER

TELECOMMUNICATIONS TECHNOLOGY INC.
PALO ALTO, CALIFORNIA 94303

DRAWING NUMBER A-P9500-031-01

DWN. BY 7.25.72

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PRINTED ON DITTO NO. 1000H CLEARPRINT

ASSEMBLY NAME ASSEMBLY, ACTIVE BOARD
ASSEMBLY NUMBER D-P9500-031-01

PARTS LIST

REF DES	ITEM NO.	STOCK NO.	DESCRIPTION	TOTAL QTY	NOTES	MFR CODE IDENT	MANUFACTURERS PART NUMBER
IC19		952000011	INTEGRATED CIRCUIT, 741TC			07263	741TC
IC20		↕	↕			07263	741TC
IC21		952000011	INTEGRATED CIRCUIT, 741TC			07263	741TC
IC22		952000169	INTEGRATED CIRCUIT LM377N	1		27014	LM377N
IC23		952000011	INTEGRATED CIRCUIT, 741TC			07263	741TC
IC24			NOT USED				
IC25		952000011	INTEGRATED CIRCUIT, 741TC			07263	741TC
Q1		962000008	TRANSISTOR, 2N5138	3		07263	2N5138
Q2		960100005	TRANSISTOR, 2N5133	5		07263	2N5133
Q3		96200008	TRANSISTOR, 2N5138			07263	2N5138
Q4		960100005	TRANSISTOR, 2N5133			07263	2N5133
Q5		960100011	TRANSISTOR, MV4891	1		04713	MV4891
Q6		960100005	TRANSISTOR, 2N5133			07263	2N5133
Q7		960100005	TRANSISTOR, 2N5133			07263	2N5133

ISSUE L CHANGE ORDER

DWN. BY 8.2.72
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TELECOMMUNICATIONS TECHNOLOGY INC.
PALO ALTO, CALIFORNIA 94303

DRAWING NUMBER AP9500-031-01

SHEET 9 OF 26

PRINTED ON DEPT NO 1000 CLEARPRINT

ASSEMBLY NAME ASSEMBLY, ACTIVE BOARD

ASSEMBLY NUMBER D-P9500-031-01

PARTS LIST

REF DES	ITEM NO.	STOCK NO.	DESCRIPTION	TOTAL QTY	NOTES	MFR CODE IDENT	MANUFACTURERS PART NUMBER
Q8		962000008	TRANSISTOR, 2N5138			07263	2N5138
Q9		960100005	TRANSISTOR, 2N5133			07263	2N5133
Q10		960100025	TRANSISTOR, 2N2369A	14		07263	2N2369A
Q11		960100025	TRANSISTOR, 2N2369A			07263	2N2369A
Q12						07263	2N2369A
Q13						07263	2N2369A
Q14						07263	2N2369A
Q15						07263	2N2369A
Q16						07263	2N2369A
Q17						07263	2N2369A
Q18						07263	2N2369A
Q19						07263	2N2369A
Q20						07263	2N2369A
Q21		960100025	TRANSISTOR, 2N2369A			07263	2N2369A

ISSUE L CHANGE ORDER

TTI TELECOMMUNICATIONS TECHNOLOGY INC. PALO ALTO, CALIFORNIA 94303

DWN. BY 7-23-72

CHK. BY 7-27-72

APPD. BY

DRAWING NUMBER A-P9500-031-01

SHEET 10 OF 26

PRINTED ON DATED NO. 1 ISSUE CLEARANCE

ASSEMBLY NAME ASSEMBLY, ACTIVE BOARD.
ASSEMBLY NUMBER D-P9500-031-01.

PARTS LIST

REF DES	ITEM NO.	STOCK NO.	DESCRIPTION	TOTAL QTY	NOTES	MFR CODE IDENT	MANUFACTURERS PART NUMBER
Q22		960100025	TRANSISTOR, 2N2369A			07263	2N2369A
Q23		960100025	TRANSISTOR, 2N2369A			07263	2N2369A
Q24		961000004	TRANSISTOR, 2N2405	2		02735	2N2405
Q25		961000004	TRANSISTOR, 2N2405			02735	2N2405
Q26			NOT USED				
Q27			NOT USED				
Q28		961000001	TRANSISTOR, 2N3054	1		07263	2N3054
R1		930700391	RESISTOR, COMP. 390 OHMS, 5%, 1/4W	11		01121	JANRCR07
R2		930700391	RESISTOR, COMP. 390 OHMS, 5%, 1/4W			01121	JANRCR07
R3		930700391	RESISTOR, COMP. 390 OHMS, 5%, 1/4W			01121	JANRCR07

TELECOMMUNICATIONS TECHNOLOGY INC.
PALO ALTO, CALIFORNIA 94303

DWN. BY [illegible] 7-25-72
CHK. BY [illegible]
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DRAWING NUMBER A-P9500-031-01

SHEET 11 OF 26

ISSUE L CHANGE ORDER

PRINTED ON DEPO NO. [illegible]

ASSEMBLY NAME ASSEMBLY ACTIVE BOARD.
ASSEMBLY NUMBER D-P9500-031-01.

PARTS LIST

REF DES	ITEM NO.	STOCK NO.	DESCRIPTION	TOTAL QTY	NOTES	MFR CODE IDENT	MANUFACTURERS PART NUMBER
R4		930700391	RESISTOR, COMP. 390 OHMS, 5%, 1/4W			01121	JANRCR07
R5						01121	JANRCR07
R6						01121	JANRCR07
R7						01121	JANRCR07
R8						01121	JANRCR07
R9						01121	JANRCR07
R10						01121	JANRCR07
R11		930700391	RESISTOR, COMP. 390 OHMS, 5%, 1/4W			01121	JANRCR07
R12		930700331	RESISTOR, COMP. 330 OHMS, 5%, 1/4W	1		01121	JANRCR07
R13		930700153	RESISTOR, COMP. 15K, 5%, 1/4W	1		01121	JANRCR07
R14		930700102	RESISTOR, COMP. 1K, 5%, 1/4W	½		01121	JANRCR07
R15		930700101	RESISTOR, COMP. 100 OHMS, 5%, 1/4W	1		01121	JANRCR07
R16		930700821	RESISTOR, COMP. 820 OHMS, 5%, 1/4W	2		01121	JANRCR07

ISSUE L CHANGE ORDER

TELECOMMUNICATIONS TECHNOLOGY INC.
PALO ALTO, CALIFORNIA 94303

DWN. BY [illegible] 7.25.72
CHK. BY [illegible] 8-4-72
APPD. BY

DRAWING NUMBER A-P9500-031-01

SHEET 12 OF 26

ASSEMBLY NAME ASSEMBLY, ACTIVE BOARD

ASSEMBLY NUMBER D-P9500-031-01

PARTS LIST

REF DES	ITEM NO.	STOCK NO.	DESCRIPTION	TOTAL QTY	NOTES	MFR CODE IDENT	MANUFACTURERS PART NUMBER
R17		920100504	RESISTOR, POT. CERMET 500K, 1/2W	2		73138	72PX
R18		930700821	RESISTOR, COMP. 820 OHMS, 5%, 1/4W			01121	JANRCR07
R19		930700474	RESISTOR, COMP, 470K, 5%, 1/4W	2		01121	JANRCR07
R20		930700104	RESISTOR, COMP, 100K, 5%, 1/4W	4		01121	JANRCR07
R21		920100504	RESISTOR, POT. CERMET 500K, 1/2W			73138	72PX
R22		930700102	RESISTOR, COMP. 1K, 5%, 1/4W			01121	JANRCR07
R23		930700181	RESISTOR, COMP. 180 OHMS, 5%, 1/4W	3		01121	JANRCR07
R24		930700102	RESISTOR, COMP. 1K, 5%, 1/4W			01121	JANRCR07
R25		930506493	RESISTOR, MET. FILM 649K, 1%, 1/8W	4		91637	MFF-1/8

ISSUE L CHANGE ORDER

DWN. BY [illegible] 7-25-72

CHK. BY [illegible] 8-2-72

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TELECOMMUNICATIONS TECHNOLOGY INC.
PALO ALTO, CALIFORNIA 94303

DRAWING NUMBER A-P9500-0310-01

SHEET 13 OF 26

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ASSEMBLY NAME ASSEMBLY, ACTIVE BOARD.
ASSEMBLY NUMBER A-P9500-031-01.

PARTS LIST

REF DES	ITEM NO.	STOCK NO.	DESCRIPTION	TOTAL QTY	NOTES	MFR CODE IDENT	MANUFACTURERS PART NUMBER
R26		930900182	RESISTOR, COMP. 1.8K, 5%, 1/4W	1		01121	JANRCR07
R27		930700181	RESISTOR, COMP. 180 OHMS, 5%, 1/4W			01121	JANRCR07
R28		930700333	RESISTOR, COMP. 33K, 5%, 1/4W	6		01121	JANRCR07
R29		930700333	RESISTOR, COMP. 33K, 5%, 1/4W			01121	JANRCR07
R30						01121	JANRCR07
R31						01121	JANRCR07
R32						01121	JANRCR07
R33		930700333	RESISTOR, COMP. 33K, 5%, 1/4W			01121	JANRCR07
R34		930505491	RESISTOR, MET. FILM, 5.49K, 1%, 1/8W	1		91637	MFF-1/8
R35		920100203	RESISTOR, POT. CERMET 20K, 1/2W	5		73138	72PX20K
R36		930503832	RESISTOR, MET. FILM, 38.3K, 1%, 1/8W	3		91637	MFF-1/8

ISSUE L CHANGE ORDER

TELECOMMUNICATIONS TECHNOLOGY INC.
PALO ALTO, CALIFORNIA 94303

DWN. BY [illegible] 2-25-72
CHK. BY [illegible] 2-7-72
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DRAWING NUMBER A-P9500-031-01

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ASSEMBLY NAME ASSEMBLY, ACTIVE BOARD.
ASSEMBLY NUMBER D-P9500-031-01.

PARTS LIST

REF DES	ITEM NO.	STOCK NO.	DESCRIPTION	TOTAL QTY	NOTES	MFR CODE IDENT	MANUFACTURERS PART NUMBER
R37		930700225	RESISTOR, COMP., 2.2M, 5%, 1/4W	3		01121	JANRCR07
R38		930501401	RESISTOR, METAL FILM, 1.40K, 1%, 1/8W	1		91637	MFF-1/8
R39		930504423	RESISTOR, MET. FILM 442K, 1%, 1/8W	1		91637	MFF-1/8
R40		930503482	RESISTOR, MET. FILM 34.8K, 1%, 1/8W	1		91637	MFF-1/8
R41		920100103	RESISTOR, POT. CERMET 10K, 1/2W	5		73138	72PX10K
R42		930508061	RESISTOR, MET. FILM 8.06K, 1%, 1/8W	1		91637	MFF-1/8
R43		920100203	RESISTOR, POT. CERMET 20K, 1/2W			73138	72PX20K
R44		930505492	RESISTOR, MET. FILM 54.9K, 1%, 1/8W	1		91637	MFF-1/8
R45		930700335	RESISTOR, COMP. 3.3M, 5%, 1/4W	1		01121	JANRCR07

TELECOMMUNICATIONS TECHNOLOGY INC.
PALO ALTO, CALIFORNIA 94303

DRAWING NUMBER: A-P9500-031-01

DWN. BY [illegible] 7.25.72
CHK. BY [illegible] 7-27-72
APPD. BY
SHEET 15 OF 26

ISSUE L CHANGE ORDER

ASSEMBLY NAME ASSEMBLY, ACTIVE BOARD.
ASSEMBLY NUMBER D-P9500-031-01.

PARTS LIST

REF DES	ITEM NO.	STOCK NO.	DESCRIPTION	TOTAL QTY	NOTES	MFR CODE IDENT	MANUFACTURERS PART NUMBER
R46		920100203	RESISTOR, POT, CERMET 20K, 1/2W			73138	72PX20K
R47		930506192	RESISTOR, MET. FILM 61.9K, 1%, 1/8W	1		91637	MFF-1/8
R48		930506493	RESISTOR, MET. FILM, 649K, 1%, 1/8W			91637	MFF-1/8
R49		930504123	RESISTOR, MET. FILM 412K, 1%, 1/8W	7		91637	MFF-1/8
R50		930700103	RESISTOR, COMP. 10K, 5%, 1/4W	6		01121	JANRCR07
R51		930506191	RESISTOR, MET. FILM 6.19K, 1%, 1/8W	1		91637	MFF-1/8
R52		920100103	RESISTOR, POT. CERMET 10K, 1/2W			73138	72PX10K
R53		930504022	RESISTOR, MET. FILM 40.2K, 1%, 1/8W	1		91637	MFF-1/8
R54		930700275	RESISTOR, COMP. 2.7M, 5%, 1/4W	1		01121	JANRCR07

ISSUE L CHANGE ORDER

TELECOMMUNICATIONS TECHNOLOGY INC.
PALO ALTO, CALIFORNIA 94303

DRAWING NUMBER A-P9500-031-01

DWN. BY [illegible] 2-25-72
CHK. BY [illegible] 2-7-72
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SHEET 16 OF 2[illegible]

ASSEMBLY NAME ASSEMBLY, ACTIVE BOARD.
ASSEMBLY NUMBER D-P9500-031-01.

PARTS LIST

REF DES	ITEM NO.	STOCK NO.	DESCRIPTION	TOTAL QTY	NOTES	MFR CODE IDENT	MANUFACTURERS PART NUMBER
R55		920100203	RESISTOR, POT. CERMET 20K, 1/2W			73138	72PX20K
R56		930504752	RESISTOR, MET. FILM 47.5K, 1%, 1/8W	1		91637	MFF-1/8
R57		930505113	RESISTOR, MET. FILM 511K, 1%, 1/8W	1		91637	MFF-1/8
R58		930504123	RESISTOR, MET. FILM, 412K, 1%, 1/8W			91637	MFF-1/8
R59		930700103	RESISTOR, COMP. 10K, 5%, 1/4W			01121	JANRCR07
R60		930505111	RESISTOR, MET. FILM, 5.11K, 1%, 1/8W	1		91637	MFF-1/8
R61		920100103	RESISTOR, POT. CERMET 10K, 1/2W			73138	72PX10K
R62		930503322	RESISTOR, MET. FILM 33.2K, 1%, 1/8W	1		91637	MFF-1/8
R63		930700225	RESISTOR, COMP, 2.2M, 5%, 1/4W			01121	JANRCR07
R64		920100203	RESISTOR, POT. CERMET 20K, 1/2W			73138	72PX20K

ISSUE L CHANGE ORDER

TELECOMMUNICATIONS TECHNOLOGY INC.
PALO ALTO, CALIFORNIA 94303

DRAWING NUMBER: A-P9500-031-01

DWN. BY [illegible] 7.25.72
CHK. BY [illegible] 7-27-72
APPD. BY
SHEET 17 OF 22

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ASSEMBLY NAME ASSEMBLY, ACTIVE BOARD
ASSEMBLY NUMBER A-P9500-031-01

PARTS LIST

REF DES	ITEM NO.	STOCK NO.	DESCRIPTION	TOTAL QTY	NOTES	MFR CODE IDENT	MANUFACTURERS PART NUMBER
R65		930503832	RESISTOR, MET. FILM, 38.3K, 1%, 1/8W			91637	MFF-1/8
R66		930504123	RESISTOR, MET. FILM, 412K, 1%, 1/8W			91637	MFF-1/8
R67		930504123	RESISTOR, MET. FILM, 412K, 1%, 1/8W			91637	MFF-1/8
R68		930700103	RESISTOR, COMP. 10K, 5%, 1/4W			01121	JANRCR07
R69		930504421	RESISTOR, MET. FILM 4.42K, 1%, 1/8W	1		91637	MFF-1/8
R70		920100103	RESISTOR, POT. CERMET 10K, 1/2W			73138	72PX10K
R71		930502872	RESISTOR, MET. FILM 28.7K, 1%, 1/8W	2		91637	MFF-1/8
R72		930700225	RESISTOR, COMP. 2.2M, 5%, 1/4W			01121	JANRCR07
R73		920100103	RESISTOR, POT. CERMET 10K, 1/2W			73138	72PX10K
R74		930503832	RESISTOR, MET. FILM 38.3K, 1%, 1/8W			91637	MFF-1/8

ISSUE L CHANGE ORDER

FTI
TELECOMMUNICATIONS TECHNOLOGY INC.
PALO ALTO, CALIFORNIA 94303

DWN. BY [illegible] 7.25.72
CHK. BY [illegible] 7-31-72
APPD. BY
DRAWING NUMBER A-P9500-031-01
SHEET 18 OF [illegible]

ASSEMBLY NAME ASSEMBLY, ACTIVE BOARD

ASSEMBLY NUMBER D-P9500-031-01

PARTS LIST

REF DES	ITEM NO.	STOCK NO.	DESCRIPTION	TOTAL QTY	NOTES	MFR CODE IDENT	MANUFACTURERS PART NUMBER
R75		930503483	RESISTOR, MET. FILM 348K, 1%, 1/8W	1		91637	MFF-1/8
R76		930504123	RESISTOR, MET. FILM 412K, 1%, 1/8W			91637	MFF-1/8
R77		930700103	RESISTOR, COMP. 10K, 5%, 1/4W			01121	JANRCR07
R78		930503651	RESISTOR, MET. FILM 3.65K, 1%, 1/8W	1		91637	MFF-1/8
R79		920200103	RESISTOR, POT. CERMET 10K, 1/2W	4		02111	43P103
R80		930502262	RESISTOR, MET. FILM 22.6K, 1%, 1/8W	1		91637	MFF-1/8
R81		930700185	RESISTOR, COMP. 1.8M, 5%, 1/4W	1		01121	JANRCR07
R82		920200103	RESISTOR, POT. CERMET 10K, 1/2W			02111	43P103
R83		930502872	RESISTOR, MET. FILM 28.7K, 1%, 1/8W			91637	MFF-1/8
R84		930503013	RESISTOR, MET. FILM 301K, 1%, 1/8W	1		91637	MFF-1/8

ISSUE L CHANGE ORDER

TELECOMMUNICATIONS TECHNOLOGY INC.
PALO ALTO, CALIFORNIA 94303

DRAWING NUMBER A-P9500-031-01

DWN. BY [illegible] 7.25.72

CHK. BY [illegible] 7-27-72

APPD. BY

SHEET 19 OF 26

PRINTED ON DEPT'D NO. 1888H CLEARPRINT

ASSEMBLY NAME ASSEMBLY, ACTIVE BOARD

ASSEMBLY NUMBER D-P9500-031-01

PARTS LIST

REF DES	ITEM NO.	STOCK NO.	DESCRIPTION	TOTAL QTY	NOTES	MFR CODE IDENT	MANUFACTURERS PART NUMBER
R85		930504123	RESISTOR, MET. FILM 412K, 1%, 1/8W			91637	MFF-1/8
R86		930700103	RESISTOR, COMP. 10K, 5%, 1/4W			01121	JANRCR07
R87		930503321	RESISTOR, MET. FILM 3.32K, 1%, 1/8W	1		91637	MFF-1/8
R88		920200103	RESISTOR, POT. CERMET 10K, 1/2W			02111	43P103
R89		930502002	RESISTOR, MET. FILM 20.0K, 1%, 1/8W	2		91637	MFF-1/8
R90		930700155	RESISTOR, COMP. 1.5M, 5%, 1/4W	1		01121	JANRCR07
R91		920200103	RESISTOR, POT,.CERMET 10K, 1/2W			02111	43P103
R92		930502002	RESISTOR, MET. FILM 20.0K, 1%, 1/8W			91637	MFF-1/8
R93		930502003	RESISTOR, MET. FILM 200K, 1%, 1/8W	1		91637	MFF-1/8
R94		930504123	RESISTOR, MET. FILM 412K, 1%, 1/8W			91637	MFF-1/8

ISSUE L CHANGE ORDER

TELECOMMUNICATIONS TECHNOLOGY INC.
PALO ALTO, CALIFORNIA 94303

DRAWING NUMBER A-P9500-031-01

DWN. BY [illegible] 7-25-72

CHK. BY [illegible] 8-2-72

APPD. BY

SHEET 2 OF

ASSEMBLY NAME ASSEMBLY, ACTIVE BOARD.
ASSEMBLY NUMBER D-P9500-031-01.

PARTS LIST

REF DES	ITEM NO.	STOCK NO.	DESCRIPTION	TOTAL QTY	NOTES	MFR CODE IDENT	MANUFACTURERS PART NUMBER
R95		930700103	RESISTOR, COMP. 10K, 5%, 1/4W			01121	JANRCR07
R96		930502260	RESISTOR, MET. FILM 226 OHMS, 1%, 1/8W	1		91637	MFF-1/8
R97		930501003	RESISTOR, COMP. 100K, 1%, 1/8W	1		91637	MFF-1/8
R98		930700222	RESISTOR, COMP. 2.2K, 5%, 1/4W	3		01121	JANRCR07
R99		930505900	RESISTOR, MET. FILM 590 OHMS, 1%, 1/8W	2		91637	MFF-1/8
R100		930505900	RESISTOR, MET. FILM 590 OHMS, 1%, 1/8W			91637	MFF-1/8
R101		930510121	RESISTOR, MET. FILM 12.1 OHMS, 1%, 1/8W	1		91637	MFF-1/8
R102		930505620	RESISTOR, MET. FILM 562 OHMS, 1%, 1/8W	2		91637	MFF-1/8
R103		930505620	RESISTOR, MET. FILM 562 OHMS, 1%, 1/8W			91637	MFF-1/8
R104		930510383	RESISTOR, MET. FILM 38.3 OHMS, 1%, 1/8W	1		91637	MFF-1/8
R105		930504870	RESISTOR, MET. FILM 487 OHMS, 1%, 1/8W	2		91637	MFF-1/8

ISSUE L CHANGE ORDER

DWN. BY [illegible] 2.5.72
CHK. BY [illegible] 2-7-72
APPD. BY
SHEET 2

TELECOMMUNICATIONS TECHNOLOGY INC.
PALO ALTO, CALIFORNIA 94303

DRAWING NUMBER A-P9500-031-01

PRINTED ON DITTO NO. 1000H CLEARPRINT

ASSEMBLY NAME ASSEMBLY, ACTIVE BOARD
ASSEMBLY NUMBER D-P9500-031-01

PARTS LIST

REF DES	ITEM NO.	STOCK NO.	DESCRIPTION	TOTAL QTY	NOTES	MFR CODE IDENT	MANUFACTURERS PART NUMBER
R106		930504870	RESISTOR, MET. FILM 487 OHMS, 1%, 1/8W			91637	MFF-1/8
R107		930501210	RESISTOR, MET. FILM 121 OHMS, 1%, 1/8W	1		91637	MFF-1/8
R108		930503090	RESISTOR, MET. FILM 309 OHMS, 1%, 1/8W	2		91637	MFF-1/8
R109		930503090	RESISTOR, MET. FILM 309 OHMS, 1%, 1/8W			91637	MFF-1/8
R110		930504220	RESISTOR, MET. FILM 422 OHMS, 1%, 1/8W	1		91637	MFF-1/8
R111			NOT USED				
R112			NOT USED				
R113			NOT USED				
R114		930700223	RESISTOR, COMP. 22K, 5%, 1/4W	1		01121	JANRCR07
R115		931000330	RESISTOR, COMP. 33 OHMS, 10%, 1W	1		01121	-

ISSUE L CHANGE ORDER

TRI TELECOMMUNICATIONS TECHNOLOGY INC. PALO ALTO, CALIFORNIA 94303

DWN. BY [illegible] 7.25.72
CHK. BY [illegible] 7-27-72
APPD. BY

DRAWING NUMBER A-P9500-031-01
SHEET 22 OF

PRINTED ON DITTO NO. 1800H CLEARPRINT

ASSEMBLY NAME ASSEMBLY, ACTIVE BOARD.
ASSEMBLY NUMBER D-P9500-031-01.

PARTS LIST

REF DES	ITEM NO.	STOCK NO.	DESCRIPTION	TOTAL QTY	NOTES	MFR CODE IDENT	MANUFACTURERS PART NUMBER
R116		930506040	RESISTOR, MET. FILM 604 OHMS, 1%, 1/8W	1		91637	MFF-1/8
R117		930700332	RESISTOR, COMP. 3.3K, 5%, 1/4W	1		01121	JANRCR07
R118		930700474	RESISTOR, COMP. 470K, 5%, 1/4W			01121	JANRCR07
R119		930700473	RESISTOR, COMP. 47K, 5%, 1/4W	1		01121	JANRCR07
R120		920200202	RESISTOR, POT. MULTI-TURN 2K	1		02111	43P202
R121		930700472	RESISTOR, COMP. 4.7K, 5%, 1/4W	2		01121	JANRCR07
R122		930700472	RESISTOR, COMP. 4.7K, 5%, 1/4W			01121	JANRCR07
R123			NOT USED				
R124			NOT USED				
R125			NOT USED				

TELECOMMUNICATIONS TECHNOLOGY INC.
PALO ALTO, CALIFORNIA 94303

DWN. BY 7.25.72
CHK. BY 8-2-72
APPD. BY

DRAWING NUMBER A-P9500-031-01

ISSUE L CHANGE ORDER

ASSEMBLY NAME ASSEMBLY, ACTIVE BOARD

ASSEMBLY NUMBER D-P9500-031-01

PARTS LIST

REF DES	ITEM NO.	STOCK NO.	DESCRIPTION	TOTAL QTY	NOTES	MFR CODE IDENT	MANUFACTURERS PART NUMBER
R126			NOT USED.				
R127			NOT USED.				
R128			NOT USED.				
R129		930700104	RESISTOR, COMP. 100K, 5%, 1/4W			01121	JANRCR07
R130		930900470	RESISTOR, COMP. 47 OHMS, 5%, 1W	2		01121	-
R131		930700181	RESISTOR, COMP. 180 OHMS, 5%, 1/4W			01121	JANRCR07
R132		930900270	RESISTOR, COMP. 27 OHMS, 5%, 1W	1		01121	-
R133		930900470	RESISTOR, COMP. 47 OHMS, 5%, 1W			01121	-
R134		930506493	RESISTOR, FIXED, CARBON, 649K, 1/8W, 1%			91C37	MFF - 1/8
R135		930700222	RESISTOR, FIXED, CARBON, 2.2K, 1/4W, 5%			01121	JANRCR07
R136		930700104	RESISTOR, FIXED, CARBON, 100K, 1/4W, 5%			01121	JANRCR07
R137		930700102	RESISTOR, FIXED, CARBON, 1K, 1/4W, 5%			01121	JANRCR07

ISSUE

CHANGE ORDER

TELECOMMUNICATIONS TECHNOLOGY INC.
PALO ALTO, CALIFORNIA 94303

DRAWING NUMBER A-P9500-031-01

SHEET 2 of

DWN. BY 9.25.72

CHK. BY 9-27-72

APPD. BY

PRINTED ON DWG NO.

ASSEMBLY NAME ASSEMBLY, ACTIVE BOARD

ASSEMBLY NUMBER D-P9500-031-01

PARTS LIST

REF DES	ITEM NO.	TTI STOCK NO.	MFR CODE IDENT	MANUFACTURERS PART NUMBER	DESCRIPTION	TOTAL QTY	NOTES
R138		930700102	01121	JANRCR07	RESISTOR, FIXED, CARBON, 1K, 1/4W, 5%		
R139		930506493	91637	MFF - 1/8	RESISTOR, FIXED, CARBON, 649K, 1/8W, 1%		
R140		930700104	01121	JANRCR07	RESISTOR, FIXED, CARBON, 100K, 1/4W, 5%		
R141		930700222	01121	JANRCR07	RESISTOR, FIXED, CARBON, 2.2K, 1/4W, 5%		
R142		930700102	01121	JANRCR07	RESISTOR, FIXED, CARBON, 1K, 1/4W, 5%		
K1		971300001	31951	100-001-6	RELAY, REED 6V, FORM C	1	
S6,S7		971600003	31918	2XF15FSB/BLK2UGR	SWITCH, PB, 2 STATION 2PDT	1	
S4-S5		971600005	31918	5XF15FSB/BLK2UGR	SWITCH, PB, 5 STATION 2PDT	1	
S8		97160006O	TTI	B0001-121-01	SWITCH, MOMENTARY	1	
T1		971900008	32255	3886	TRANSFORMER, 3886	1	

ISSUE L CHANGE ORDER

DWN. BY

CHK. BY

APPD. BY

SHEET 25 OF 26

DRAWING NUMBER A P9500-031-01

TTI TELECOMMUNICATIONS TECHNOLOGY INC. SUNNYVALE, CALIFORNIA 94086

ASSEMBLY NAME ASSEMBLY, ACTIVE BOARD

ASSEMBLY NUMBER D-P9500-031-01

PARTS LIST

REF DES	ITEM NO.	STOCK NO.	DESCRIPTION	TOTAL QTY	NOTES	MFR CODE IDENT	MANUFACTURERS PART NUMBER
	1	P9500-032-01	PRINTED CIRCUIT BOARD, REV G	1		TTI	P9500-032-01
	2	#6-32 x 1	SCREW, BIND HD, SST	1		-	-
	3	#2-56 x 7/16	SCREW, BIND HD, SST	2		-	-
	4	#2-56	NUT, KEP	2		-	-
	5	#6	WASHER, FLAT	1		-	-
	6	971400007	SOCKET, INT. CKT, 8 PIN DIP	6		00779	583640-1
	7	971400001	SOCKET, INT. CKT, 14 PIN DIP	3		71785	14 D.I.P.
	8	971400002	SOCKET, INT. CKT, 16 PIN DIP	2		71785	16 D.I.P.
	9	971100001	PAD, TRANSISTOR MTG	9		13103	7717-7
	10		NOT USED				
	11	971200005	TERMINAL, SMALL STAKING	33		00779	86147-2
	12	#6-32 x 1/4	NUT, KEP	1			

ISSUE L CHANGE ORDER

DWN. BY

CHK. BY

APPD. BY

TELECOMMUNICATIONS TECHNOLOGY INC.
PALO ALTO, CALIFORNIA 94303

DRAWING NUMBER: A P9500-031-01

SHEET 26 OF 26

PRINTED ON BUFFO NO 1000H CLEARPRINT

ASSEMBLY NAME ASSEMBLY, SWITCHING BOARD.
ASSEMBLY NUMBER D-P9500-029-01.

PARTS LIST

REF DES	ITEM NO.	STOCK NO.	DESCRIPTION	TOTAL QTY	NOTES
C1		910500009	CAPACITOR, 2 uf, 200 VDC	2	
C2		910500009	CAPACITOR, 2 uf, 200 VDC	-	
C3		910500010	CAPACITOR, 10 uf, 200 VDC	3	
C4		910100007	CAPACITOR, .1 uf, 100 V	3	
C5		910500010	CAPACITOR, 10 uf, 200 VDC	-	
C6		910500010	CAPACITOR, 10 uf, 200 VDC	-	
C7		910100007	CAPACITOR, .1 uf, 100V	-	
C8		910100007	CAPACITOR, .1 uf, 100V	-	

TELECOMMUNICATIONS TECHNOLOGY INC.
PALO ALTO, CALIFORNIA 94303

DWN. BY [illegible] 7/25/72
CHK. BY Courtney
APPD. BY [illegible] 8/4

DRAWING NUMBER: A-P9500-029-01

SHEET 1 OF 6

ISSUE H CHANGE ORDER ~~430~~ ~~480~~ 517 ~~536~~ 575

PRINTED ON DIEPO NO 1800H CLEARPRINT

PRINTED ON DIEFO NO 1000H CLEARPRINT

DWN. BY [illegible] 7/25/72

CHK. BY [illegible]

APPD. BY

SHEET 2 OF 6

TELECOMMUNICATIONS TECHNOLOGY INC.
PALO ALTO, CALIFORNIA 94303

DRAWING NUMBER A-P9500-029-01

ASSEMBLY NAME ASSEMBLY, SWITCHING BOARD.
ASSEMBLY NUMBER D-P9500-029-01.

PARTS LIST

REF DES	ITEM NO.	STOCK NO.	DESCRIPTION	TOTAL QTY	NOTES
CR1		940200005	DIODE, 1N5231B	1	
CR2		940200032	DIODE, 1N4148	4	
CR3		940200032	DIODE, 1N4148	-	
CR4		940200032	DIODE, 1N4148	-	
CR5		940200032	DIODE, 1N4148		
K1		971300002	RELAY 1 FORM A	1	
K2		971300005	RELAY AZ 420-1011-4L	2	
K3		971300005	RELAY AZ 420-1011-4L	-	
K4		971300006	RELAY 1 FORM C	1	
K5		971300019	RELAY 2 FORM C (DPDT)	1	

ISSUE H CHANGE ORDER

ASSEMBLY NAME ASSEMBLY, SWITCHING BOARD.
ASSEMBLY NUMBER D-P9500-029-01.

PARTS LIST

REF DES	ITEM NO.	STOCK NO.	DESCRIPTION	TOTAL QTY	NOTES
R1		931300901	RESISTOR, 900 OHMS, 5%, 5W	3	
R2		931300901	RESISTOR, 900 OHMS, 5%, 5W	-	
R3		931300901	RESISTOR, 900 OHMS, 5%, 5W	-	
R4		931000102	RESISTOR, 1.0K 10%, 1W	1	
R5		931300331	RESISTOR, 330 OHMS, 5%, 5W	1	
R6		931300501	RESISTOR, 500 OHMS, 5%, 5W	3	
R7		930505320	RESISTOR, MET. FILM, 523 OHMS, 1%, 1/8W	2	
R8		930510931	RESISTOR, MET. FILM 93.1 OHMS, 1%, 1/8W	1	
R9		930505230	RESISTOR, MET. FILM, 523 OHMS, 1%, 1/8W	-	
R10		930700822	RESISTOR, COMP. 8.2K 5%, 1/4W	1	

ISSUE 4 CHANGE ORDER

TELECOMMUNICATIONS TECHNOLOGY INC.
PALO ALTO, CALIFORNIA 94303

DWN. BY [illegible] 5/25/72
CHK. BY Cantile
APPD. BY

DRAWING NUMBER: AP9500-029-01

SHEET 3 OF 6

PRINTED ON DIEPO NO. 1000H CLEARPRINT

ASSEMBLY NAME ASSEMBLY, SWITCHING BOARD

ASSEMBLY NUMBER D-P9500-029-01

PARTS LIST

REF DES	ITEM NO.	STOCK NO.	DESCRIPTION	TOTAL QTY	NOTES
R11		930502260	RESISTOR, MET. FILM 226 OHMS, 1%, 1/8W	2	
R12		930506650	RESISTOR, MET. FILM 665 OHMS, 1%, 1/8W	1	
R13		930900272	RESISTOR, 2.7K, 5%, 1W	2	
R14		930800392	RESISTOR, 3.9K, 10%, 1/2W	1	
R15		930502260	RESISTOR, MET. FILM 226 OHMS, 1%, 1/8W	-	
R16		930700102	RESISTOR, COMP. 1K, 5%, 1/4W	4	
R17		930900272	RESISTOR, 2.7K, 5%, 1W	-	
R23		931300501	RESISTOR, 500 OHMS, 5%, 5W		
R18		931300501	RESISTOR, 500 OHMS, 5%, 5W	-	
R22		930700221	RESISTOR, COMP. 220 OHMS 5%. 1/4W	1	
R19		930700102	RESISTOR, COMP. 1K, 5%, 1/4W	-	
R20		930700102	RESISTOR, COMP, 1K, 5%, 1/4W	-	
R21		930700102	RESISTOR, COMP, 1K, 5%, 1/4W		

DWN. BY [illegible] 5/25/72

CHK. BY [illegible]

APPD. BY

SHEET 4 OF 6

TELECOMMUNICATIONS TECHNOLOGY INC.
PALO ALTO, CALIFORNIA 94303

DRAWING NUMBER: A-P9500-029-01

ISSUE 4 CHANGE ORDER

PRINTED ON DIEPO NO 1000M CLEARPRINT

ASSEMBLY NAME ASSEMBLY, SWITCHING BOARD.
ASSEMBLY NUMBER D-P9500-029-01.

PARTS LIST

REF DES	ITEM NO.	STOCK NO.	DESCRIPTION	TOTAL QTY	NOTES
S1		971600010	SWITCH, ROTARY 3 POS, 7 SEC.	1	
S2		971600009	SWITCH, ROTARY 7 POS, 10 SEC.	1	
S3		971600008	SWITCH, ROTARY 3 POS. 4 SEC.	1	
S4/S5		971600003	SWITCH, 2 STATION 2 PDT	1	
S6		971600002	SWITCH, 1 STATION 4 PDT	2	
S7		971600002	SWITCH, 1 STATION 4 PDT	-	
T1		971900006	TRANSFORMER, #3168	3	
T2		971900006	TRANSFORMER, #3168	-	
T3		971900001	TRANSFORMER, #3301	1	

ISSUE H CHANGE ORDER

TTI TELECOMMUNICATIONS TECHNOLOGY INC. PALO ALTO, CALIFORNIA 94303

DWN. BY 7/25/72 CHK. BY APPD. BY

DRAWING NUMBER: A-P9500-029-01

SHEET 5 OF 6

PRINTED ON DIETZO NO 1000H CLEARPRINT

PRINTED ON DIEPO NO 1000H CLEARPRINT

ASSEMBLY NAME ASSEMBLY SWITCHING BOARD.
ASSEMBLY NUMBER D-P9500-029-01.

PARTS LIST

REF DES	ITEM NO.	STOCK NO.	DESCRIPTION	TOTAL QTY	NOTES
T4	40	971900006	TRANSFORMER, #3168	-	
	1	D-P9500-030-01	P.C. BOARD, REVISION F	1	
	2	971400001	SOCKET, 14 PIN DIP	3	
	3	971400005	SOCKET, ST 140-A1	2	
				-	
	4	972500002	RETAINER ST140-1	2	
	5	971200005	TERMINAL, SMALL STAKING	18	

ISSUE 4 CHANGE ORDER

DWN. BY [illegible] 7/25/72
CHK. BY Cassidy
APPD. BY
SHEET 6 OF 6

TELECOMMUNICATIONS TECHNOLOGY INC.
PALO ALTO, CALIFORNIA 94303

DRAWING NUMBER: AP9500-029-01

ASSEMBLY NAME ASSEMBLY, MODEL 9500B

ASSEMBLY NUMBER P9500-018-03

PARTS LIST

REF DES	ITEM NO.	TTI STOCK NO.	MFR CODE IDENT	MANUFACTURERS PART NUMBER	DESCRIPTION	TOTAL QTY	NOTES
	1	P9500-007-03	TTI	C-P9500-007-03	MARKING, FRONT PANEL	1	
	2	P9500-022-01	TTI	D-P9500-022-01	BOARD SUPPORT	1	
	3	P9500-031-01	TTI	D-P9500-031-01	ASSEMBLY, ACTIVE BOARD REV-K	1	
	4	P9500-029-01	TTI	D-P9500-029-01	ASSEMBLY, SWITCHING BOARD REV H	1	
	5	P9500-014-01	TTI	C-P9500-014-01	BRACKET, DIAL	1	
	6	12127-02	TTI	12127-02	ASSEMBLY, CABLE (4.00")	1	
	7	12127-03	TTI	12127-03	ASSEMBLY, CABLE (5.50")	1	
	8	970800002	2	#128	KNOB	3	
	9	970800001	2	#127	KNOB	1	
	10	970200001	17479	K51183-12NW3 MODIFIED	ASSEMBLY, PUSHBUTTON, M.F.	1	
	11	972600001	74199	25A07Z45	SPEAKER	1	
	12	972500073		A-B0001-126-01	GRILLE, SPEAKER	1	
	13	P9500-081-01	TTI	B-P9500-081-01	LABEL, WARNING	1	
	14	920100501	01221	70A4G040P501M	POTENTIOMETER, SINGLE TURN, 500 ohms	1	
	15	972700001	65092	MODEL 1931DCUA S-813	METER	1	
	16	10001-139-01	TTI	10001-139-01	CASTING, REAR	1	
	17	972500020	3	9117	BUMPER	4	
	18	P9500-073-01	TTI	D-P9500-073-01	CABLE, ASSY	1	
	19	P9500-041-01	TTI	D-P9500-041-01	ASSEMBLY, PROBE SOCKET	1	

ISSUE F CHANGE ORDER 644

TTI TELECOMMUNICATIONS TECHNOLOGY INC. SUNNYVALE, CALIFORNIA 94086

DRAWING NUMBER A P9500-018-03

DWN. BY

CHK. BY

APPD. BY

SHEET 1 OF 3

ASSEMBLY NAME ASSEMBLY, MODEL 9500B

ASSEMBLY NUMBER P9500-018-03

PARTS LIST

REF DES	ITEM NO.	TTI STOCK NO.	MFR CODE IDENT	MANUFACTURERS PART NUMBER	DESCRIPTION	TOTAL QTY	NOTES
	20	10001-136-29	TTI	10001-136-29	I.D. TAG, REAR PANEL	1	
	21	10001-141-01	TTI	10001-141-01	COVER, TOP & BOTTOM	2	
	22	10001-072-01	TTI	10001-072-01	COVER, TOP	1	
	23	P9500-008-04	TTI	C-P9500-008-04	MARKING, SIDE COVER	1	
	24	4-40 x 1/2		4-40 x 1/2	SCREW, BIND HD., S.S.	2	
	25	P9500-009-02	TTI	D-P9500-009-02	BEZEL, SIDE	1	
	26	940300012	28480	5082-4550	LED YELLOW	3	
	27	940300011	28480	5082-4950	LED GREEN	2	
	28	#10-32 x 3/8	--	#10-32 x 3/8	SCREW, BIND HD., S.S.	2	
	29	#4-40 x 3/8	--	#4-40 x 3/8	SCREW, FLAT HD., S.S.	4	
	30	#6-32	--	#6-32	KEP NUT	13	
	31	#4-40	--	#4-40	KEP NUT	11	
	32	#6-32 x 3/8	--	#6-32 x 3/8	SCREW, BIND HD., S.S.	21	
	33	#4 CLEARANCE	--	#4 CLEARANCE	STANDOFF, 1/4 O.D. x 1/2 LONG	3	
	34	12127-04	TTI	12127-04	ASSEMBLY, CABLE (11.50")	1	
	35	10001-140-01	TTI	10001-140-01	ASSEMBLY, FRAME & HANDLE	1	
	36	P9500-070-01	TTI	D-P9500-070-01	BRACKET, CONNECTOR	1	
	37	#6-32 x 1/2	--	#6-32 x 1/2	SCREW, BIND HD., S.S.	4	
	38	B-P9500-037-01	TTI	B-P9500-037-01	BRACKET, CONNECTOR	2	

ISSUE F CHANGE ORDER 644

DWN. BY [illegible] 4/19/17

CHK. BY

APPD. BY

SHEET 2 OF 3

TTI TELECOMMUNICATIONS TECHNOLOGY INC. SUNNYVALE, CALIFORNIA 94086

DRAWING NUMBER AP9500-018-03

ASSEMBLY NAME ASSEMBLY, MODEL 9500B

ASSEMBLY NUMBER P9500-018-03

PARTS LIST

TTI TELECOMMUNICATIONS TECHNOLOGY INC. SUNNYVALE, CALIFORNIA 94086

DWN. BY [signature] CHK. BY APPD. BY

DRAWING NUMBER AP9500-018-03

SHEET 3 OF 3

REF DES	ITEM NO.	TTI STOCK NO.	MFR CODE IDENT	MANUFACTURERS PART NUMBER	DESCRIPTION	TOTAL QTY	NOTES
	39	1/4 x 1/4 x 1/2	--	1/4 x 1/4 x 1/2	FOAM, FLEX, POLYURETHANE, 2 LB/CU FT (GRAY)	2	
	40	972100009	71400	3 AG - 1/4	FUSE, FAST-BLO, 1/4 AMP	1	
	41	#6	--	#6	LOCKWASHER, INTERNAL TOOTH	8	
	42	#4-40 x 7/8	--	#4-40 x 7/8	SCREW, FLAT HD., S.S.	3	
	43	#4-40 x 5/16	--	#4-40 x 5/16	SCREW, BIND HD., S.S.	2	
	44	972200002	4	A1087	FUSE HOLDER CUP (SPARE)	1	
	45	#8-32	--	#8-32	KEP NUT	2	
	46	#8	--	#8	SOLDER LUG	2	
	47	5/8 O.D. x 3/8I.D.	--	5/8 O.D.x3/8 I.D.	DRESS WASHER	4	
	48	6-32 x 3/16		6-32 x 3/16	SCREW, FLAT HD SS	8	
	49	#2-56 x 1/4	--	#2-56 x 1/4	MACHINE SCREW, BIND HD.	4	
	50						
	51	PURPLE	--	PURPLE	LOCKTITE	A/R	
	52	GLUE	--	GLUE	GLUE	A/R	
	53	SPACER	6	9224-A171-10A	SPACER - 1/4 x 1/4	2	
	54						
	55	FLAT CABLE CLAMP	76381	3484-1000	CABLE CLAMP, FLAT	2	
	56	PATENT TAG	--	----	PATENT TAG	1	

ISSUE E CHANGE ORDER 641